

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
14 April 2005 (14.04.2005)

PCT

(10) International Publication Number  
**WO 2005/032894 A1**

(51) International Patent Classification<sup>7</sup>: **B60R 22/28**,  
22/34

(21) International Application Number:  
PCT/SE2004/001325

(22) International Filing Date:  
15 September 2004 (15.09.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0323361.6 6 October 2003 (06.10.2003) GB

(71) Applicant (for all designated States except US): **AUTO-  
LIV DEVELOPMENT AB** [SE/SE]; S-447 80 Vårgårda  
(SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LENNING, Anders**  
[SE/SE]; Karsjö, Karsjövägen 32, S-434 97 Kungsbacka  
(SE).

(74) Agent: **MEULLER, Erik**; Autoliv Development AB,  
S-447 83 Vårgårda (SE).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

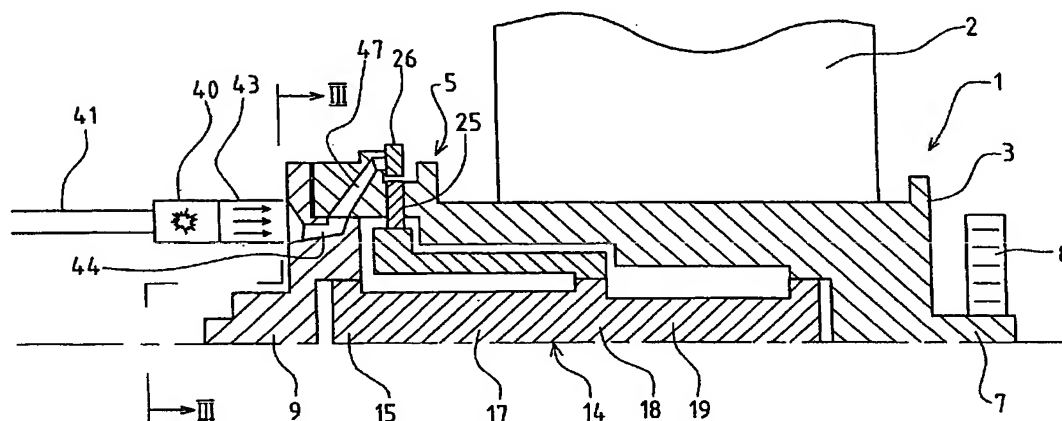
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: A SAFETY DEVICE



(57) Abstract: A safety device incorporates a force limiter to permit the restricted paying out of a safety belt. The arrangement includes a two part spindle within a retractor. On a first part of the spindle the safety belt is wound. A second part of the spindle is configured to be locked. The two spindle parts are interconnected by a torsion bar. The torsion bar has two regions of different strengths, the junction between the two regions is releasably connected to part of the spindle. When the connection is present there is one energy absorbing level and when the connection is broken there is another energy absorbing level. The connection is broken in response to a relative movement between the two spindle parts caused by an initial belt force in excess of a predetermined force.